

REGNECENTRALEN
18. February 1960.

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Valby,
Denmark.

Dear Professor Rutishauser,

Thank you very much for your valuable comments on the ALGOL 60 draft report. The question on procedures raised in your second letter must, if I understand our agreements right, be answered simply by saying that formal identifiers which will correspond to parameters where useful output will appear cannot appear in the value list. This follows directly from document 26 which in the sixth line from the end says: "If specification is made by value, the value of the actual parameter is assigned to the corresponding formal parameter as an initialisation of the procedure compound." Thus an assignment like the one appearing in your second example, page 2 of your letter of 17. Febr., :

$z := y$

will never be inserted. Your difficulty, as far as I can see, is connected to your use of the notions input and output parameters. These notions are abolished in the present procedures. However, you can of course achieve what you want by writing the procedure body suitably. The specification value is useful if you want to be absolutely sure that the actual parameter entered in this place will not be changed. But of course this also works the other way: if you cannot change the value of the ~~the~~ actual parameter, surely you cannot provide a useful output in that position either.

Looking quickly through your letters I have the following remarks (which are only for your orientation on my immediate reactions):

Although I do not feel quite convinced by the examples on the type question I am grateful for your trouble in making your position clear. The matter will of course stand as in the report except that section 3.1.4.2 will have to be changed. (See Woodger's letter of 16th Febr.).

I would be very unhappy to force people to insert unnecessary brackets around relations, since one can always insert them whenever the expression becomes unwieldy. Of course the examples of 3.4.2 look horrible, but they are intended not as a practical guide, but as a support of the syntactic definitions.

Of course conditional expressions must allow labels. That is simply a mistake. Thanks for pointing it out.

Also sections 4.5.3.2 and 4.5.4 are in severe need of revision (4.5.4 drops out completely).

I agree with your suggestion of leaving out the specification real.

On the question of translating a procedure statement I can explain you how this will be done in our translator: The result of the translation of the call will be (a) a number of subroutines, one for each actual parameter which is not simply an identifier, (b) a jump order to the procedure itself, and (c) as many program parameters as there are parameter positions, each giving one address. This simply means that in the call we always specify by name, leaving it to the procedure itself to pick up the value right at the beginning, if the particular position is called by value. Incidentally, this way of doing the thing was, I believe, mentioned in Paris. It probably was through this entirely practical remark that Woodger got the impression that the name concept had been dropped.

Thanks for offering to send the Runge-Kutta example. I expect to produce a complete revised report and send it as a ALGOL BULLETIN SUPPLEMENT, so I would need at least 100 copies (I would prefer 150 in fact!). If you are able to produce this lot it would of course save us some work. On the other hand if it is a heavy burden, don't hesitate to let us do it.